

ART. XIII.—*Termites from the Australian Region: Descriptions of New Species and hitherto undescribed Castes.*

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(With Plates XXIII.–XXVI.).

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Introduction.

In this paper nine species of Termites are proposed as new, of which number five are referred to the genus *Calotermes* and four to the genus *Eutermes*. In addition to these the alate caste of two species of *Eutermes* and the soldier caste of two species of *Calotermes* are described for the first time. A new name is proposed for a common Victorian species, which has been fully described and provisionally referred to *Calotermes obscurus* (Walker) in an earlier paper.

For the sake of uniformity with the papers of all students of Australian Termites excepting Walker (1853) and Hagen (1858), the generic name *Eutermes* has been retained for the group of species with nasute soldiers possessing reduced mandibles; it is intended, however, to adopt the inevitable change to *Nasutitermes* Banks later on when dealing with the group more comprehensively.

The method of recording measurements and colours is that adopted in earlier papers. The nomenclature of the wing-veins is that of Holmgren (1909). With the exception of Figs. 1 and 16, the outlines of thoracic nota have been drawn from balsam preparations; it is necessary, therefore, to make allowance for the effects of slight compression in the case of strongly arched sclerites, e.g., as in *Calotermes*.

In the preparation of this, and a more extensive paper now nearing completion, I have had the cordial assistance of Mr. J. A. Kershaw, Curator of the National Museum, who has been instrumental in obtaining material for study from the various Australian Museums, official entomologists, and from several field workers. I am also indebted personally to many well-known entomologists who, during the past twelve years, have rendered indispensable assistance in amassing and studying the unrivalled collection now at my disposal.

Systematic Descriptions.

CALOTERMES (CALOTERMES) RUFINOTUM, nov. nom.

C. obscurus Hill, non Walker. Proc. Linn. Soc. N.S.W., xlii. (4), 1921.

The possibility that the Victorian specimens described in the above paper might not be conspecific with Walker's species was suggested at the time. The rediscovery of the latter species in the type locality disposes of the doubt that has hitherto existed and renders it necessary to propose a new name for the eastern form, a full description of which was published in 1921.

Locality.—Victoria: Seaford (type loc.), Beaconsfield, Cockatoo, Lakes Entrance; New South Wales: Batlow.

The New South Wales specimens (all castes) were collected by Mr. W. W. Froggatt in a rotten log, where they were associated with *Porotermes adamsoni* (Frogg.).

Type imago and soldier in the National Museum of Victoria.

CALOTERMES (CALOTERMES) OLDFIELDI, n. sp.

(Plate XXIII., Figs. 1 and 2.)

Imago.

Colour.—Head and thorax Sandford's-brown, tergites of abdomen ochraceous tawny, clypeus whitish, labrum orange, principal veins of wings cinnamon-brown, membrane hyaline, under surface and legs clay-colour.

Head.—With very few and very short setae, small, narrowed in front of eyes, widening behind the eyes to the broadly rounded posterior margin; frons depressed. Clypeus large, about four-fifths wider than long, sloping on the sides, anterior margin straight. Labrum large, markedly convex, narrowed at base, wide across middle and rounded in front, its orange colour contrasting strongly with the whitish clypeus and brown head. Eyes subtriangular, moderately large, (0.357 vertically \times 0.374 laterally) and prominent, 0.238 from lower margin of head. Antennae 19- or 20-jointed; 3rd joint larger and darker than 2nd and 4th.

Thorax.—Pronotum very large, anterior margin markedly concave, the border elevated, the sides rounded and slightly produced, posterolateral angles broadly rounded, posterior margin markedly concave, the setae very short and scanty.

Wings.—Short, the principal veins rather dark and bearing a few setae; radial sector generally with about four branches, but very variable; media very indistinct, in characteristic position for the sub-genus.

Measurements.—

	mm.
Length with wings - - - - -	15.25
Length without wings - - - - -	8.75 — 9.25
Head, to apex of labrum, long - - - - -	1.76 — 1.88
Head, to apex of clypeus, long - - - - -	1.53 — 1.65
Head, wide - - - - -	1.42
Pronotum, long, 1.19 — 1.25; wide - - - - -	1.65 — 1.82
Wings, forewing, long, 11.00; wide - - - - -	3.13
Tibia iii, long - - - - -	1.42

Soldier.

Similar to *C. condonensis* Hill, from which species it differs in the following characters: Head shorter, wider and darker, mandibles shorter, stouter and more abruptly shouldered at the base (Fig. 1), anterior hyaline portion of clypeus large, as long as posterior dark portion (hardly visible in *C. condonensis*), labrum much larger, gula wider (Fig. 2), eyes larger, frons less concave, antennae, 13- 18-jointed, the joints somewhat shorter and narrower, pronotum more concave posteriorly, femora not so thick.

Measurements.—

	mm.
Total length - - - - -	11.50
Head, with mandibles, long - - - - -	4.16 — 4.44
Head, to labral suture, long - - - - -	2.85 — 3.19
Head, wide - - - - -	1.76 — 1.88
Head, deep - - - - -	1.42 — 1.65
Mandibles, from external articulation, long - - - - -	1.53 — 1.71
Gula, at narrowest part, wide - - - - -	0.37
Eyes, diameter - - - - -	0.170 x 0.289
Pronotum, long, 1.42; wide - - - - -	1.99 — 2.05
Tibia iii, long - - - - -	1.36

The three soldiers in the type colony have rudimentary wings.

Locality.—Victoria; Kiata (type loc.), Bamawm, Keilor.

Described from a small colony collected by Mr. Robert Oldfield (July, 1924) in a branch of a Eucalypt 20 feet from the ground. The Bamawm and Keilor specimens, an alate imago in each case, were cut from rotten logs early in February.

Types and others in the National Museum of Victoria.

CALOTERMES (CALOTERMES) OBSCURUS (Walker).

(Plate XXIII., Figs. 3-7.)

Cat. Neurop. Ins. Coll. Brit. Mus., 1853; Hagen, Mon. der Termiten Linn. Entom., 1858 (*C. convexus* Walk.); Froggatt, P.L.S. N.S.W., xxi., 1896; Desneux, Gen. Insectorum, 1904 (*C. convexus* Walk.); non Hill, P.L.S. N.S.W., xlvi., 1921 (*C. (?) obscurus* Walk.).

Through the courtesy of Dr. G. A. K. Marshall and Mr. B. Uvarov, specimens collected in the type locality (Swan River, S. W.A.) by Mr. J. Clark, have been compared with the damaged

type of Walker's species, and have been found to agree as far as comparison is possible. The species provisionally referred to *C. obscurus* by me (1921), and for which a new name (*C. rufinotum*) is proposed in this paper, is obviously quite a distinct species, though remarkably like it in the soldier caste.

The following are a supplementary description of the imago and a description of the hitherto undescribed soldier of *C. obscurus* (Walk.):—

Imago.

Colour.—Head, pronotum and dorsum of abdomen dark chestnut to castaneous, the frons and middle of pronotum generally lightest; legs, labrum and sternites of abdomen clay-colour; wings cinnamon-brown, veins darker.

Head.—Small, with very few setae, markedly longer than wide, broadly rounded behind, nearly straight on sides; frons flattened, with a small concavity in the middle in line with the posterior margin of eyes. Eyes very small (0.238×0.255), subtriangular, finely faceted, hardly projecting, the lower margin a little more than their height from the lower margin of head. Ocelli rather large, nearly circular, contiguous with eyes. Clypeus small, arcuate in front. Labrum small, a little more than half as long as wide, markedly convex, rounded on sides, truncate in front, with scanty pale hairs on apical half. Antennae (Fig. 3) 14- or 15-jointed; 1st joint short and wide, three-fifths as wide as long; 2nd half as long as and one-fifth narrower than 1st; 3rd longer and wider than 2nd; 4th shorter than 3rd and about as wide; 5th a little longer and more rounded than 4th; 6th to 8th progressively longer.

Thorax (Fig. 4).—Pronotum strongly arched, with scanty pale setae, anterior margin concave, the sides slightly rounded and widening posteriorly, posterior margin parallel to anterior margin except in middle, where it is concave.

Wings.—Short and narrow, with minute setae on principal veins; venation variable; media always joining the radial sector beyond the middle, sometimes near its extremity; cubitus with many branches, these usually forked several times, the main stem often joining the radial sector a little beyond the junction of the media.

Measurements.—

		mm.
Length with wings	- - -	10.00 — 10.50; rarely 11.75
Length without wings	- - -	5.50 — 6.50; rarely 8.50
Head, to apex of labrum, long	- - -	1.36 — 1.48
Head, to clypeofrontal suture, long	- - -	1.08 — 1.14
Head, wide	- - -	1.14
Head, deep	- - -	0.80
Antennae, long	- - -	1.42
Pronotum, long	0.80 — 0.85; wide-	- - 1.25 — 1.36
Wings, long	6.50 — 7.00; wide-	- - 1.93 — 2.05
Tibia iii, long	- - -	0.97

Soldier.

Colour.—Ochraceous-orange, darker anteriorly, labrum and antennae same colour as back of head.

Head.—Long and narrow, less than half as wide as long (with mandibles), parallel on sides, frons sloping gently to clypeus; frontal and transverse sutures indistinct; antennal carinae heavily chitinised. Post-clypeus short, with a row of four setae near anterior margin; ante-clypeus half as long as post-clypeus, hyaline. Labrum wider than long, with sides slightly narrowed to the truncate apex, with fairly numerous reddish setae. Mandibles (Fig. 5) short and stout, with two teeth beyond the middle in left and three in the basal half of the right. Gula narrow. Antennae (Fig. 6) 14-jointed; 3rd joint longer, darker and more narrowed at the base than 2nd and 4th, or, 2nd longer and more quadrate than 3rd; 14th very small.

Thorax (Fig. 7).—Pronotum with scanty pale short setae, concave in front, sides nearly straight and widened posteriorly, posterior margin parallel to anterior margin except in middle, where it is concave. Posterior margin of meso- and metanotum truncate or slightly sinuate. (All the soldiers in some colonies have rudimentary wings.)

Measurements.—

	mm.
Total length - - - - -	6.50 — 8.50
Head, with mandibles, long - - - - -	2.40 — 3.70
Head, without mandibles, long - - - - -	1.71 — 2.45
Head, to anterior margin of clypeus, long - - - - -	2.16 — 2.67
Head, deep - - - - -	1.14 — 1.30
Head, wide - - - - -	1.14 — 1.42
Gula, at narrowest part, wide - - - - -	0.22
Pronotum, long 0.74 — 0.91; wide - - - - -	1.25 — 1.48

Locality.—West Australia: Swan River, Denmark, Ludlow.

Affinities.—From Hagen's statements it would appear that *C. convervus* (Walk.) and *C. improbus* Hagen are closely allied to, if not identical with, this species; specimens of these two Tasmanian species are not available for study, however. The soldiers from different colonies vary considerably in size, but there is little difference in individuals from the same community. The average size appears to be much nearer the maximum than minimum recorded above. The imagos also vary in size, as well as in colour, the majority being of the minimum size and darkest colour.

Type soldier, with associated imagos and nymphs, in the National Museum of Victoria.

CALOTERMES (GLYPTOTERMES) IRIDIPENNIS, Froggatt.

(Plate XXIII., Figs. 8 and 9.)

Proc. Linn Soc. N.S.W., xxi., 1896.

Queen.

Colour.—Head very dark brown, nearly black; meso- and metanotum a little lighter; under surface, labrum, palpi and antennae

argus-brown; femora, tarsi and the last two sternites nearly as dark as mesonotum; anteclypeus hyaline, with ochraceous shading about the middle.

Head.—Finely shagreened, almost devoid of setae, those present confined to frons, broadly rounded behind and on sides to the eyes; frons slightly depressed in the middle, with minute furrows falling towards the centre. Eyes moderately large (0.342×0.342) and prominent, separated from the lower margin of the head by a space equal to half the diameter; lower margin of genae bent up as in pronotum. Ocelli small, broadly oval (0.114 long), close to, but not contiguous with, eyes. Postclypeus very short, paler than vertex, without setae, anterior margin slightly arcuate. Labrum short and very wide, about twice as wide as long, truncate in front, with very few setae. Antennae 15-jointed, 1.70 long.

Measurements.—

	mm.
Total length - king, 7.00; queen - - -	8.00
Head, to apex of labrum, long - - -	1.65 — 1.75
Head, to clypeofrontal suture, long - - -	1.25
Head, wide - - - - -	1.45
Pronotum, long 0.85; wide - - - - -	1.42
Tibia iii, long - - - - -	1.14

Soldier.

Colour.—Head vinaceous rufous; mandibles black, anteclypeus hyaline, tinged with ochraceous; labrum and antennae ochraceous; thorax, legs and abdomen buckthorn-brown.

Head (Fig. 8).—Nearly parallel on the sides, bluntly rounded behind, slightly narrowed to the prominent anterolateral angles; frons sloping at an angle of 45 degrees to the clypeus; clypeus and anteclypeus short, not conspicuous, the former bearing a few moderately long and stout setae, remainder of head excepting labrum almost hairless, the surface glabrous and minutely shagreened; labrum short and broad, with about twelve moderately long setae; gula (Fig. 9) much narrowed posteriorly, where it is one-fifth as wide as the head; antennae 13- to 15-jointed, generally 13-jointed; mandibles short and stout, each with three short, broad and inconspicuous teeth.

Thorax.—Pronotum (Fig. 8) a little more than twice as wide as long, reniform.

Legs.—Short and stout, femora thickened, nearly as wide as long.

Abdomen.—Tergites and sternites clothed as in imago, the sternites bearing also a few long, reddish setae; cerci short and stout; styli moderately slender.

Measurements.—

	mm.
Total length - - - - -	9.00 — 10.00
Head, with mandibles, long - - - - -	3.15 — 4.10
Head, without mandibles, long - - - - -	2.28 — 3.16

Head, to anterior margin of clypeus, long	- -	2.33 — 2.73
Head, wide	- -	1.48 — 1.76
Gula, at narrowest part, wide	- -	0.28
Pronotum, long	0.74 — 0.97; wide	- -
Tibia iii, long	- -	1.53 — 1.88
		1.25

Locality.—Victoria: Frankston (type loc.), Melbourne, Belgrave (alate imago, 23/3/24), Beaconsfield; New South Wales: Dorrigo, Upper Lansdowne (2 alate imagos, 25/2/21).

Biology.—Although very destructive and fairly common, the only references in literature to this species relate to the type (imago); there are, however, several alate imagos and two series of soldiers and nymphs in the National Museum (collected in a suburb of Melbourne by the late F. P. Spry) from the trunk of a living ornamental tree (12-16/2/16). Through the courtesy of Mr. W. Laidlaw, Director of the Botanic Gardens, Melbourne, the National Museum has recently had opportunities of securing additional material from the trunks of two living trees (*Pyrus pashia* and *Agonis flexuosa*). The first series was collected on 12/6/24, and comprised two de-alated males, two de-alated gravid females, about 12 soldiers, and an immense number of nymphs in all stages of development. The oldest nymphs then had short, orange-rufous wing-pads, 13-jointed antennae, and faintly pigmented eyes. The second series was taken on 8/12/24, when soldiers and nymphs only were secured. The most advanced of the latter caste were apparently in the same stage of development as those taken six months earlier. The Beaconsfield colony, which was taken on 6/11/23, in the rotten sapwood of a Eucalypt felled some years earlier by saw-millers, appeared to be a young one; it comprised a de-alated male and female, one soldier and several hundred nymphs, all situated from ground-level upwards to a height of 3 feet. The oldest nymphs were then apparently in the same stage of development as those found on 12th June and 8th December. The Dorrigo specimens (collected by Mr. W. W. Froggatt) comprise soldiers and workers only, which agree with the Victorian specimens. The imagos from Upper Lansdowne (collected by Dr. E. W. Ferguson) are smaller than Victorian examples, but appear to be referable to this species.

Type soldier, with associated imagos and nymphs, in the National Museum of Victoria. The type imago cannot be definitely indicated, but it is unquestionably one of three specimens (collected by the late W. Kershaw at Frankston) in the same collection.

CALOTERMES (GLYPTOTERMES) CLARIPENNIS, n. sp.

(Plate XXIII., Figs. 10, 11 and 12.)

Colour.—Head russet; thorax and abdomen ochraceous-tawny; legs cinnamon-buff; wings hyaline, with anterior veins, base of media and cubitus tawny.

Head (Fig 10).—Small, narrow, shagreened, almost devoid of setae, frons depressed. Clypeus about two-thirds wider than long, with two pairs of long setae, sloping on the sides, broadly truncate in front. Labrum light orange-yellow, large, about twice as wide as long, convex, narrowed at base, markedly swollen on sides. Eyes moderately large and prominent, subtriangular (0.323 vertically×0.272 horizontally), 0.204 from lower margin of head. Ocelli large (0.119 long), broadly oval, close to eyes. Mandibles (Fig. 11), left with apical tooth larger than subapical, the latter followed by a broad triangular tooth about as long as the subapical one; right with apical tooth similar to that of left; the subapical tooth equally long, but wider, the following tooth wide and occupying more than one-third the width of the mandible. Antennae 13- or 14-jointed; 1st joint short and stout; 2nd, about half as long and much narrower; 3rd longer than 2nd (sometimes markedly so), narrower at base, wider at apex, rarely equal to 2nd; 4th about as long as 2nd, rounded; 5th and succeeding joints larger than 4th; apical joint shorter and narrower than preceding one.

Thorax (Fig. 12).—Pronotum about as wide as head, concave in front, rounded on sides and in front, the anterior margin slightly elevated, a deep impression on either side behind the raised margin, sides and posterior margin produced and fringed with scattered pale setae, longest on the anterolateral angles and sides. Posterior margin of meso- and metanotum concave, a dark brown median line through the anterior half of the sclerite.

Wings.—Costa and subcosta very short, the radial sector and media running parallel and very near the costal border to near the apex of the wing; cubitus very obscure, excepting at the base, the main stem traversing the wing just above the middle, with about twelve branches, only the first of which is well defined; anales with about six or eight branches; a few setae on anteriormost veins; scale-like papillae very obscure.

Legs.—Short and stout, with scattered, mostly short, stout setae; femora thickened, those of hind leg nearly half as wide as long; spurs long, finely serrated; claws long and moderately stout.

Abdomen.—Segments fringed apically with scanty, long pale setae; cerci and styli moderately large.

Measurements.—

mm.

Length with wings	- - - - -	9.50 — 10.00
Length without wings	- - - - -	5.50 — 6.00
Head, to apex of labrum, long	- - - - -	1.19 — 1.36
Head, to clypeofrontal suture, long	- - - - -	0.97 — 1.08
Head, wide	- - - - -	1.08
Pronotum, long 0.62; wide	- - - - -	0.97 — 1.08
Wings, forewings, long 7.75; wide	- - - - -	2.05
Wings, hindwings, long 7.50; wide	- - - - -	2.16
Tibia iii, long	- - - - -	0.85

Locality.—Lord Howe Island (A. Musgrave and G. Whitley, December, 1923).

Type imago, and associated nymphs in the Australian Museum, Sydney (No. K48725); paratypes in the National Museum of Victoria.

CALOTERMES (CRYPTOTERMES) ARCANUS, n. sp.

(Plate XXIII., Figs. 13, 14 and 15.)

Imago.

Similar to *Calotermes (Cryptotermes) primus* Hill, from Townsville, N.Q., from which species it may be distinguished by its larger size, darker and longer wing and much darker antennae. Antennae (Fig. 13) 16- or 17-jointed, suffused with dark brown. Wings tawny-olive; costa, radius and radial sector darker; a few minute setae on radial sector and distal one-third of costa; membrane covered with scale-like papillae; radial sector with 7 or 8 superior branches; media very indistinct except at base, joining radial sector about the distal one-third of wing, the junction not always thickened; cubitus with about 14 branches, the distal 7 or 8 indicated by rows of scale-like papillae, the main stem sometimes joining the radial sector about midway between the junction of the media and the apex of the wing, the extremity thickened when thus terminated.

Measurements.—

	mm.
Length with wings - - - - -	10.00 — 10.50
Length without wings - - - - -	5.00
Head, to apex of labrum, long - - - - -	1.14
Head, to clypeofrontal suture, long - - - - -	0.91
Head, wide - - - - -	0.97
Eyes, 0.255 — 0.272 vertically × 0.306 — 0.323 horizontally.	
Eyes from lower margin of head - - - - -	0.17
Pronotum, long 0.51; wide - - - - -	1.02
Wings, long 8.25; wide - - - - -	2.28

Soldier.

Similar to *Calotermes (Cryptotermes) primus*, but differentiated by its larger head, anterior margin of frontal flange without emargination or furrows, and not overhanging the frons in the middle, although very prominent on the sides, the dorsal surface of head with much deeper impression behind the frontal flange, pronotum with anterior margin similarly thickened, and serrate, but the emargination more obtuse.

Measurements.—

	mm.
Total length - - - - -	4.00 — 4.50
Head, from base to frontal flange, long - - - - -	1.14
Head, wide - - - - -	1.14
Head, deep - - - - -	0.85
Pronotum, long, 0.80; wide - - - - -	1.08
Tibia iii, long - - - - -	0.57

Locality.—Lord Howe Island (A. Musgrave and G. Whitley, 10/12/23).

Type imago, soldier and associated nymphs in the Australian Museum, Sydney (No. K48724); paratypes in the National Museum of Victoria.

CALOTERMES (CRYPTOTERMES) SECUNDUS, n. sp.

(Plate XXIII., Fig. 16.)

Soldier.

Colour.—Yellow behind, darkening anteriorly to the frontal flange, which is nearly black; mandibles castaneous; pronotum, antennae, labrum same colour as base of head.

Head (Fig. 16).—Very short and wide, shagreened, with scattered long setae; frontal flange prominent, especially on sides, broadly emarginate when viewed from front or from behind, with two shallow furrows on each side of the middle; frons excavated, rugose, sloping to the base of clypeus, a prominent vertical ridge on each side in line with lateral margins of clypeus, and extending upwards from the clypeofrontal suture to the frontal flange; lower lateral margins of head prolonged to form a blunt, horn-like projection directed upward and forward at an angle of 45 degrees with the axis of head, and hardly reaching the apex of second antennal joint, above this projection there is another similar but shorter one arising as a prolongation of the antero-dorsal margin of the antennal foveola. Clypeus short and very wide (0.49), its anterior margin cream-colour, slightly arcuate. Labrum short and wide, light orange-yellow, with a group of moderately long, pale setae in the middle. Antennae 13-jointed; 1st joint short and stout, widest at apex; 2nd more than half as long as 1st and one-sixth narrower; 3rd about as long as 2nd and very little wider; 4th and 5th a little more than half as long as 2nd and 3rd and less narrowed at base; 6th and 7th a little longer and about as wide as 4th and 5th, but more globose.

Thorax.—Cervical sclerites scarcely darker than base of head. Pronotum with anterior margin thickened and dark in colour, markedly convex in middle, indistinctly serrate, slightly elevated in the middle, and markedly raised towards the sides, the anterolateral corners, sides and posterolateral corners rounded, posterior margin slightly sinuate in the middle, with scanty moderately long setae.

Legs.—Short and stout; spurs serrate.

Measurements.—

	mm.
Total length (dried specimen) - - - - -	4.50
Head, with mandibles, long - - - - -	1.99
Head, posterior margin to frontal flange, long - - - - -	1.14
Head, wide - - - - -	1.19
Head, deep - - - - -	0.85
Pronotum, long 0.85; wide - - - - -	1.14
Tibia iii, long - - - - -	0.70

Locality.—Northern Territory: Darwin.

Affinities.—Allied to *Planocryptotermes nocens* Light (paratype examined), but distinguished, *inter alia*, by the presence of vertical ridges on frons and differently shaped frontal flange. From *C. (Cryptotermes) primus* Hill it differs as above, and in having the anterior margin of the pronotum less angulate, and less serrate and the sides more narrowed to the posterior margin.

Described from a small colony found in the trunk of a living cocoanut palm previously damaged by weevils (*Diocalandria*), (G.F.H., 8/5/13). A second colony, comprising only young nymphs and larvae, was found in the stem of an indigenous shrub (dead) at East Point, near Darwin (G.F.H., 13/10/15). In both instances only a small area of the host-plant was affected, and, as is the rule with *Cryptotermes*, there was no communication with the ground.

Type soldier and associated nymphs in the National Museum of Victoria.

EUTERMES APIOCEPHALUS Silvestri.

(Plate XXIV., Figs. 17-20.)

Die Fauna Südwest-Australiens, 1909. Mjöberg, Arkiv för Zoologi, Bd. 12, No. 15, 1920.

Imago.

Colour.—Nearly black; antennae, abdomen and legs a little lighter than head and pronotum; clypeus auburn; wings sooty black; apex of tibiae and the tarsi pale.

Head (Fig 17).—Small, glabrous, moderately setaceous, hemispherical behind the eyes, frons flattened. Fontanelle small, lying in a deep depression, its shape not well defined, but apparently oval. Eyes rather small (0.272—0.289 diam.), finely faceted, moderately prominent, about 0.085 from lower margin of head. Ocelli oval, very prominent, small (0.102 long), separated from the eyes by a space equal to their length. Postclypeus dark, but distinctly lighter than head, with darker suture, markedly convex and glabrous, hemispherical behind, truncate in front, a little more than half as long as wide; anteclypeus hyaline suffused with yellow, large, a little less than half as long as postclypeus, produced in the middle, rounded in front. Exposed basal part of mandibles yellow, dentition as shown in Fig. 18. Antennae (Fig. 19) long, 15-jointed; 1st joint nearly twice as long as wide; 2nd almost cylindrical, half as long and much narrower than 1st, 3rd half as long as 2nd, and very narrow, smallest of all; 4th as long as 2nd and a little wider, broadly oval; 5th noticeably shorter and narrower than 4th; 5th-9th progressively longer; 9th-13th almost equally long; 14th longer and more cylindrical than 13th; 15th about as long as 14th, elongate oval.

Thorax (Fig. 20).—Pronotum moderately setaceous, short and wide, the anterior margin sinuate and markedly raised behind the

extreme edge, the anterolateral corners narrowed, a deep impression on either side of the median line behind the raised anterior margin, another, but shallower, impression in the middle line near the posterior margin, the sides sloping sharply to the markedly sinuate posterior border. Posterior margin of meso- and metanotum strongly emarginate.

Wings.—Very dark in colour, the radial sector very distinct, and with numerous setae to its extremity; distal four-fifths of media, the branches of the cubitus (excepting the proximal eight or nine) very indistinct.

Legs.—Moderately long and slender.

Abdomen.—Cylindrical, very setaceous, the setae short and pale; cerci short and stout.

Measurements.—

	mm.
Length with wings - - - - -	10.00
Length without wings - - - - -	6.00
Head, to apex of labrum, long - - - - -	1.3
Head, to clypeofrontal suture, long - - - - -	0.62 — 0.68
Head, wide - - - - -	1.08
Antennae, long - - - - -	1.53 — 1.65
Pronotum, long - 0.54; wide - - - - -	1.00
Tibia iii, long - - - - -	1.08
Wings, forewings, long 7.50 — 8.00; wide - - - - -	2.00 — 2.16
Wings, hindwings, long 7.25 — 7.50; wide - - - - -	2.20 — 2.32

Queen.

Total length, 13.00; abdomen, wide, 4.00.

Locality.—South-west Australia; Hovea, Gosnell's, Pinjarra, Armadale, Boyanup, Kelmscott (J. Clark), Mundaring (J. Clark and C. F. Hill).

Identification.—The identification of this species is based upon a comparison of soldiers and workers from Hovea which were identified for me by Professor Silvestri with the soldiers and workers in several complete nest series from the above localities. I have seen no soldiers with antennae quite agreeing with that figured by Silvestri, though antennae with the 3rd joint only slightly larger than the 2nd are common. In one example only the 3rd joint is shortest of all, in all others the 4th is shortest, and the 2nd and 3rd are about equal. I have no doubt whatever that the species here described as *E. apiocephalus* Silv. is conspecific with *E. aagaardi* Mjob. (type locality Mundaring).

Type imago and associated soldiers and workers in the National Museum of Victoria.

EUTERMES WESTRALIENSIS Hill.

(Plate XXIV., Figs. 21-24.)

Proc. Linn. Soc. N.S.W., xlvii., 1921.

Imago.

Colour.—Head and pronotum nearly black; legs, basal half of antennae, postclypeus and abdomen a little lighter; apical half of

antenna and the tarsi light yellowish brown like base of mandibles; basal half of labrum a little lighter than base of mandibles, apical half hyaline; wings dark brown.

Head (Fig. 21).—Small, flat on summit, markedly glabrous, the setae scanty and mostly very small. Clypeus small, markedly convex, a little more than twice as wide as long (0.272×0.595), very little lighter in colour than summit of head; anteclypeus short, slightly produced in the middle. Labrum about as long as clypeus, widest across middle, broadly rounded in front. Eyes small (0.255×0.289), very prominent, finely faceted, separated from the lower margin of the head by a space less than that separating ocelli from eyes. Ocelli small, elongate-oval, widely separated from eyes, i.e., by a space exceeding their length. Antennae (Fig. 23) 16-jointed; 1st joint large and dark coloured, twice as long and two-thirds wider than 2nd; 3rd short and narrow; 4th noticeably wider and more globose than 3rd; 5th markedly longer and wider than 4th and 6th, as large as 7th; 7th to 15th about equal in length; 16th, a little shorter and narrower than 15th, oval. Mandibles as shown in Fig. 22. Fontanelle moderately large, conical behind, strongly forked anteriorly.

Thorax (Fig. 24).—Pronotum small, with scanty, rather short yellow setae, much narrower than head, with a deep impression on either side of the median line behind the markedly raised anterior margin, the latter nearly straight when viewed from above, anterolateral angles rounded, the sides narrowed to the slightly sinuate posterior margin. Posterior margin of meso- and metanotum widely emarginate.

Wings.—The radius, radial sector, and first four to six branches of cubitus dark, the media and remaining branches of cubitus instinct, the border, principal veins and membrane very setaceous.

Legs.—Moderately long and slender, moderately setaceous, tarsi markedly paler than tibiae and femora; claws and spurs long and slender.

Abdomen.—Short and wide, moderately densely clothed with short setae.

Measurements.—

	mm.
Length with wings - - - - -	11.50 — 12.00
Length without wings - - - - -	5.50 — 6.00
Head, to apex of labrum, long - - - - -	1.42
Head, to clypeofrontal suture, long - - - - -	0.80
Head, wide - - - - -	1.19
Antennae, long - - - - -	2.00
Pronotum, long 0.62; wide - - - - -	0.91
Wings, forewings, long, 9.50; wide - - - - -	2.56
Wings, hindwings, long, 9.25; wide - - - - -	2.67
Tibia iii, long - - - - -	1.42

Locality.—West Australia: Gosnell's, Armadale, Mundaring (J. Clark).

Described from a long series of alate imagos from the type locality (Gosnell's), the associated soldiers and workers of which have been compared with the types of these castes. Alate forms were taken on 12th March.

Affinities.—The imago bears a striking superficial resemblance to *E. apiocephalus* Silv., from which species it is easily distinguished by its larger size, lighter wings, one more joint in the antennae and much narrower and less angulate pronotum. The respective soldiers and workers of these two species cannot be confused.

Biology.—Mr. Clark informs me that on the hills this species tunnels in the ground under stones, where stores of grass cut into short lengths are to be found. The mounds are described in the paper referred to above.

Type imago, soldier and worker in the National Museum of Victoria.

EUTERMES PERACUTUS, n. sp.

(Plate XXIV., Figs. 25 and 26.)

Soldier.

Colour.—Head, basal half chestnut shading into very dark brown anteriorly; basal three-fifths of rostrum nearly black, apical two-thirds lighter than base but darker than base of head; 1st joint of antennae like apex of rostrum, the following joints, excepting the last two or three, dark (Prout's) brown; thorax and abdominal tergites Prout's brown, femora a little lighter, tibiae and tarsi distinctly lighter; sternites of abdomen tawny-olive. Smaller form of soldier generally similar to the larger, but lighter coloured throughout.

Head (Fig. 25).—Very long and narrow, widest about the basal one-third, then narrowed sharply to the base of rostrum, where it is slightly constricted and much darker in colour; rostrum very long and narrow, a little shorter than remainder of head, with a group of setae on dorsal surface about the middle and more setae towards the apex. Antennae (Fig. 26) 13- or 14-jointed; when 13-jointed the 3rd joint markedly longer than the 2nd and 4th, and generally with a slight constriction before the middle; when 14-jointed the 3rd shorter than 4th; the joints otherwise very long and slender.

Thorax.—Pronotum very small, of the usual form, very dark in colour, excepting for a transverse pale band behind the upturned anterior half; with very few setae.

Legs.—Long and slender, moderately setaceous, the femora and extreme base of tibiae distinctly darker than the remainder of the tibiae and the tarsi.

Abdomen.—Narrow at base, wide in middle and pointed at apex; tergites glabrous, with very scanty fringe of moderately long setae at the apex of each.

Measurements.—	Small form. mm.	Large form. mm.
Total length - - - -	3.25	4.25
Head, to apex of rostrum, long -	1.42 — 1.53	1.70 — 1.82
Head, wide - - - -	0.68	0.85 — 0.88
Head, deep - - - -	0.40	0.57
Antennae, long - - - -		1.88 — 2.05
Pronotum, long - - - -	0.20	0.25
Pronotum, wide - - - -	0.35	0.52
Tibia iii, long - - - -	0.96	1.14

The small form appears to differ from the larger one in colour and size only.

Worker.

Colour.—Head at base chestnut (shade darker than in soldier), deepening anteriorly to dark (Prout's) brown; antennae brown at base, yellow towards apex; clypeus distinctly lighter than antennae; labrum light orange-yellow; thorax and abdominal tergites mummy-brown to Dresden-brown, the former with a distinct median pale line passing through it; legs and under surface whitish.

Head.—With very few setae, widest at the genae, rather sharply narrowed posteriorly; sutures pale and very distinct; frons depressed, with a deep impression on either side of the middle; postclypeus small, two-fifths wider than long, hemispherical behind, truncate in front, with indistinct median suture and very few setae, the latter near anterior margin; anteclypeus hyaline, large, markedly produced in front, nearly as long as postclypeus. Labrum small, narrow at base, very much wider in the middle and rounded in front. Antennae 14- or 15-jointed, variably segmented as in soldier.

Thorax.—Pronotum small, about half as wide as head, somewhat similar to that of soldier, the anterior half rounded in front, with distinct emargination, the whole surface with scattered moderately stout setae, longest and most numerous towards the anterior border.

Legs.—Long and slender, moderately setaceous.

Abdomen.—Large, narrow at base and apex, widest in middle, the tergites glabrous, moderately setaceous and conspicuously dark in colour; sternites very pale, suffused with yellow or brown; cerci large.

Measurements.—	Small form. mm.	Large form. mm.
Total length - - - -	5.00	5.75 — 6.00
Head, to apex of labrum, long -	1.48	1.76
Head, to clypeofrontal suture, long -	0.96	1.02
Head, wide - - - -	1.25	1.36
Antennae, long - - - -	..	1.93
Pronotum, long - - - -	..	0.37
Pronotum, wide - - - -	..	0.54
Tibia iii, long - - - -	..	1.23

Locality.—West Australia: Beverley (Type loc.), York, Chidlow's Well (J. Clark), Merredin (L. J. Newman).

Affinities.—Most closely allied to *E. tumulus* Froggatt, from which species the smaller soldier is distinguished, *inter alia*, by a narrower and slightly constricted head, the dorsal surface (in profile) of which is markedly depressed in the middle (not nearly straight, as in *E. tumulus*), and markedly longer jointed antennae. A large form of soldier is unknown in the last-mentioned species. The dark colour of the soldier and worker, and especially the very dark rostrum of the former caste, are striking features of the proposed new species.

Biology.—Mr. Clark states that this species does not build mounds but tunnels in the soil under large stones. It is a grass-cutting species.

Type soldier and worker in the National Museum of Victoria.

EUTERMES CENTRALIENSIS, n. sp.

(Plate XXIV., Figs. 27-29.)

Soldier.

Colour.—Head ochraceous-tawny to russet, rostrum dark bay, anterior part of pronotum and tergites, of abdomen cinnamon-brown.

Head (Figs 27 and 28).—Moderately large, spherical in dorsal aspect, with very few setae, rostrum short and moderately stout, about one-third as long as remainder of head; dorsal surface of head in profile nearly straight. Antennae (Fig. 29) 13-jointed, the joints moderately long and slender; 2nd joint shorter than 3rd, very little shorter than 4th; 5th and remaining joints long and slender; 13th a little shorter than 12th.

Thorax.—Pronotum small, of usual form, the anterior half dark; with few setae.

Legs.—Long and slender.

Abdomen.—Dark in colour; with few setae except towards the apex.

Measurements.—

mm.

Total length	-	-	-	-	-	-	-	4.00
Head, long	-	-	-	-	-	-	-	1.70 — 1.82
Head, wide	-	-	-	-	-	-	-	1.14 — 1.19
Head, deep	-	-	-	-	-	-	-	0.68 — 0.74
Pronotum, long	0.28;	wide	-	-	-	-	-	0.62
Tibia iii, long	-	-	-	-	-	-	-	1.14

Worker.

Colour.—Dorsum of head tawny, with very distinct sutures; vertex and genae light buff; frons suffused with tawny, transverse suture indicated by a broad pale line much wider than

frontal suture; clypeus and labrum pale orange-yellow; a dark reddish spot at each end of the former; thorax and abdominal tergites light tawny-olive.

Head.—Almost devoid of setae, widest behind the insertion of antennae, narrowed to the broadly rounded posterior margin; frontal suture narrow, widening out anteriorly to form a triangular pale area bounded by the transverse suture. Postclypeus small, strongly convex, less than half as long as wide, with obscure median suture and very few setae; anteclypeus about half as long as postclypeus, markedly produced in front. Labrum small, shorter than clypeus, narrow at base, widest behind the middle, narrowed to the bluntly pointed apex, with very few setae. Antennae 14-jointed; 4th joint slightly shorter than 2nd, 3rd and 5th, or 2nd, 3rd and 4th equal and 5th a little longer, or 3rd markedly longer than 2nd and 4th.

Thorax.—Pronotum much narrower than head, anterior half bent up and narrowed to the deeply notched anterior border, with very few and very short setae.

Legs.—Moderately short and stout, with few setae; claws short.

Abdomen.—With few setae, these very short except on venter, where some are long.

Measurements.—	mm.
Total length - - - - -	4.50 — 5.00
Head to apex of labrum, long - - - - -	1.45 — 1.50
Head, to clypeofrontal suture, long - - - - -	0.93
Head, wide - - - - -	1.14 — 1.25
Pronotum, long 0.28; wide - - - - -	0.68

First-form nymph.

Total length, 5.75; head, long, 1.02; head, wide, 0.97; pronotum, long, 0.45; pronotum, wide, 0.85; antennae, 15-jointed; pronotum, with anterior margin markedly elevated, corners rounded and sides narrowed to the wide and obscurely emarginate posterior margin; wing-buds faintly suffused with brown.

Locality.—Central Australia (Drs. Horne and Nicholls).

Affinities.—From *E. pyriformis* Frogg. the soldier differs, *inter alia*, in having the head and body markedly less setaceous, the rostrum shorter and of uniform colour, antennae 13- (not 14-) jointed, antennal joints distinctly shorter. From *E. longipennis* Hill it differs in having a larger and less setaceous head, one joint less in the antennae, and the segmentation different.

Type soldier and worker in the National Museum of Victoria.

EUTERMES EXITIOSUS, n. sp.

(Plate XXV., Figs. 30-35.)

Imago.

Colour.—Head dark chestnut-brown; postclypeus, labrum, antennae, thorax, legs and venter yellow-ochre to clay-colour;

wing-stumps mummy-brown; tergites of abdomen clay-colour, much suffused with brown; wings mummy-brown at base, lighter towards apex, anterior margin clay-colour.

Head (Fig. 30).—Moderately large, depressed behind the clypeus, broadly rounded behind, moderately setaceous. Eyes large (0.342 — 0.375 × 0.400 — 0.450) and prominent, close (0.085) to lower margin of head. Ocelli very large, broadly oval (0.102 × 0.153), about half the distance from the eyes that the latter are from the lower margin of head. Fontanelle small, but distinct, linear, forked anteriorly. Postclypeus large, less than half as long as wide (0.255 × 0.630), much lighter than head, with median suture indistinct and with few setae; anteclypeus hyaline, about one-third the length of postclypeus, sides sloping slightly to the anterior margin, which is but little produced in the middle. Labrum small, rather setaceous, about as long and wide as clypeus, narrow at base, widest across middle. Antennae (Fig. 31) long and moderately stout, 15-jointed; 1st joint a little longer than half its width; 2nd as long as 1st is wide, slightly narrowed at base; 3rd one-fifth shorter and a little narrower than 2nd; 4th slightly longer and noticeably wider than 3rd; 5th as long as but narrower than 4th, wider than 3rd; 6th a little longer, wider and narrower at the base than 4th; 6th-14th increasing in length progressively, but very gradually; 15th shorter than 14th, elongate-oval.

Thorax (Fig. 32).—Pronotum a little narrower than head, slightly situate in front, the anterior margin bent up and slightly notched, two deep impressions on either side, one in the anterolateral angle and a deeper one between it and the median line, anterolateral angles rounded, sides narrowed sharply to the moderately sinuate posterior margin, setaceous, some of the setae conspicuously longer than the majority. Posterior margin of meso- and metanotum wide and more obtusely emarginate than pronotum.

Wings.—Very large, with numerous setae on membrane, all veins excepting the distal half of media and last two or three branches of cubitus very distinct, the costal margin beyond the middle distinctly yellow; cubitus with about 6 branches in forewing and eight in hindwing, the distal branches sometimes forked once or twice.

Legs.—Long and moderately stout and hairy.

Abdomen.—Large, broad, broadly rounded at apex, very setaceous; cerci moderately large.

Measurements.—	mm.
Length with wings - - - - -	25.00 — 26.50
Length without wings - - - - -	6.50 — 7.00
Head, to apex of labrum, long - - - - -	1.42
Head, to clypeofrontal suture, long - - - - -	0.80
Head, wide - - - - -	1.19 — 1.25
Antennae, long - - - - -	2.00
Pronotum, long, 0.74; wide - - - - -	1.14
Wings, forewings, long, 14.50; wide - - - - -	4.00
Wings, hindwings, long, 13.75; wide - - - - -	4.20
Tibia iii, long - - - - -	1.48

Soldier.

Colour.—Head dark chestnut-brown as in imago, the base of rostrum darker, the apex more reddish, a pale median line extending posteriorly from the middle of head to the vertex; anterior half of pronotum same colour as head; antennae, remainder of thorax and tergites of abdomen Dresden-brown; sternites a little lighter, legs much lighter.

Head (Figs. 33 and 34).—With very few setae, short and wide, widest at middle, broadly rounded behind, rostrum moderately stout, shorter than remainder of head, dorsal surface in profile nearly straight. Antennae (Fig. 35) 13-jointed; 1st joint cylindrical, one-fifth wider and more than twice as long as 2nd; 2nd shortest of all, very little shorter than 4th; 3rd markedly longer than 2nd and 4th, very little wider than 2nd; 4th-6th increasing in length progressively, 6th as long as 3rd; 7th and 8th about as long as 6th; 8th-12th decreasing in length; 13th noticeably shorter than 12th.

Thorax.—Pronotum of usual form, the anterior half contrasting in colour with the posterior, anterior margin slightly emarginate, with scanty long setae.

Legs.—Long and rather stout, with few setae on femora; claws and spurs long and slender.

Abdomen.—Short and broad, the tergites excepting the first three much more setaceous than remainder of insect, some setae very long; sternites like posterior tergites, with scattered very long setae.

Measurements.—

							mm.
Total length (variable according to position of head)	-	-	-	-	-	-	3.00 — 3.75
Head, long	-	-	-	-	-	-	1.76 — 1.82
Head, wide	-	-	-	-	-	-	1.08 — 1.14
Pronotum, long, 0.20; wide	-	-	-	-	-	-	0.55
Tibia iii, long	-	-	-	-	-	-	1.08

Soldiers from different colonies vary somewhat in colour and size of head.

Worker.

Colour.—Head ochraceous-buff, with two broad cinnamon-brown bands on each side of the median line, extending from posterior margin of frons towards vertex, the outer pair extending nearly to posterior margin, inner pair shorter and wider; head sutures indistinct; postclypeus and labrum antimony-yellow; antennae and legs cream.

Head.—Short and wide, widest at middle, sides slightly narrowed to the broadly rounded posterior margin, with very few setae. Antennae 14-jointed; 3rd joint nearly always markedly longer than 2nd and 4th; 9th-13th increasing in length progressively; 14th markedly shorter and narrower than 13th. Post-

clypeus small (0.285×0.570), strongly convex and glabrous, median suture very indistinct; anteclypeus about half as long as postclypeus, slightly produced in middle. Labrum similar to that of imago.

Thorax.—Pronotum similar in shape to that of soldier, but of uniform pale colour and with shorter setae.

Legs.—As in soldier.

Abdomen.—Large, widest in middle, broadly rounded behind.

Measurements.—

	mm.
Total length	4.50
Head, to apex of labrum, long	1.88
Head, to clypeofrontal suture, long	0.91
Head, wide	1.36
Pronotum, long, 0.34; wide	0.74
Tibia iii, long	1.08

Locality.—South-West Australia: Ludlow (type loc.), Pinjarra, Albany, Lyall Mill (J. Clark), Bunbury (L. J. Newman), Perth (L. J. N. and J.C.); South Australia (from South Australian Museum Collection); Victoria: Kewell (James Hill), and ? from other North-Western localities (Jos. A. Hill, F. E. Wilson, A. J. Campbell, R. Oldfield and D. Long).

Affinities.—The imago does not appear to closely resemble any of the previously known Australian species; all castes, however, are very like several undescribed species of the group to which *E. fumipennis* (Walker) belongs, and the soldiers are certainly conspecific with the specimens referred to by Silvestri (1909) as *E. fumipennis* Froggatt (I have examined some of these specimens from the West Australian Museum). Silvestri uses the same text-figures (221 and 222) for both *E. fumipennis* and *E. fumigatus*, crediting the former species to Froggatt and the latter (correctly) to Brauer in the text and to Froggatt in the explanation of figures. Authentic specimens of *E. fumipennis* (Walker) (type locality "New Holland") are unknown to me, and until a complete series is discovered, and the contained alate imagos found to agree with the unique type, I hesitate to deal with a large number of series the imagos of which have not been found, or, where known, have not been compared with Walker's type. In the case of the proposed new species the alate form has been compared with the above type by Mr. B. Uvarov, through the courtesy of Dr. G. A. K. Marshall, and unhesitatingly referred to a distinct species "the shape of the prothorax being very different in the type (*E. fumipennis*) in that it is scarcely narrowed behind." Froggatt gives a full description of a species which he refers to *E. fumipennis*, but his concluding remarks indicate doubt in his mind as to the correctness of his determination. I have not seen alate imagos of the proposed new species from South Australia or Victoria, but queens from these localities appear to differ from imagos in the type series only in their paler colour. The Kewell series contains a proportion of

soldiers with entirely dark heads and workers of smaller size than usual.

Biology.—Mr. Clark states that the termitarium is a mound about 2 feet high (rarely up to 4 feet), composed of loose crumbling sandy material on the outside to a depth of from one-half to one inch and of much harder material within. The interior is of more open construction than is the case in the mounds of other species known to him.

Type imago, soldier and worker in the National Museum of Victoria.

EUTERMES GRAVEOLUS, n. sp.

(Plate XXV., Figs. 36-38; Plate XXVI., Figs. 39-42.)

Imago.

Very similar to *E. exitiosus*, n. sp., but smaller; head shorter and generally a little lighter in colour; eyes much larger and more coarsely faceted; head and body more setaceous; pronotum (Fig. 37) longer and wider; wings much shorter, lighter in colour, especially at proximal end, two anteriormost veins distinctly more widely separated at the proximal end.

Measurements.—	mm.
Length with wings - - - - -	15.00 — 15.75
Length without wings - - - - -	7.50 — 8.00
Head, from base to apex of labrum, long - -	1.50
Head, to clypeofrontal suture, long - - -	1.02
Head, wide - - - - -	1.42
Antennae (Fig. 36; 15-jointed), long - - -	2.00
Eyes, vertically, 0.493; laterally, - - - -	0.595
Pronotum, long, 0.85; wide - - - - -	1.42
Wings, forewings, long, 12.50; wide - - -	3.50
Wings, hindwings, long, 12.00; wide - - -	3.75
Tibia iii, long - - - - -	1.70

Included in the long series of alate imagos in the type colony are one imago measuring (with wings) 13.50 long, and a considerable number measuring only 8.00 — 9.00 long. In these the head and body are not much smaller than in normal examples, but the wings are greatly reduced; they are obviously abnormal specimens.

Soldier.

I can find no reliable character by which the soldier of this species can be distinguished from that of *E. exitiosus*. Individuals from different colonies vary in size and colour of head, as in the latter species.

Measurements.—	mm.
Total length - - - - -	4.00
Head, long - - - - -	1.73
Head, wide - - - - -	0.97
Antennae (Fig. 38; 13-jointed), long - - -	1.53 — 2.10
Tibia iii, long - - - - -	1.14

Worker.

Very similar to that of *E. exitiosus*, but head generally darker and the dark areas more extensive, i.e., extending further laterally and posteriorly. The two species cannot be differentiated on these characters, however.

Measurements.—	mm.
Total length - - - - -	5.00
Head, to apex of labrum, long - - - - -	1.19
Head, to clypeofrontal suture, long - - - - -	0.97
Head, wide - - - - -	1.36
Pronotum, long, 0.28; wide - - - - -	0.68
Antennae (14-jointed), long - - - - -	1.25
Tibia iii, long - - - - -	1.16

Locality.—Northern Territory: Darwin (type loc.) and district, Bathurst Island (G.F.H.).

Affinities.—A complete nest series from Magnetic Island, N.Q., G.F.H., 14/11/22 (Plate XXVII., Fig. 4), and possibly many series of soldiers and workers from the following localities may be regarded as a local race of the above:—Rockhampton (C. Barrett), Townsville, and vicinity, Malanda (G.F.H.), and Cape River (G. F. Cook). Imagos in the first-mentioned series differ from the typical series in having the head a little larger and darker, wings darker at the base and generally longer, proximal one-third of radial sector closer to radius, numerous short veins between media and radial sector (almost entirely wanting in typical series), wing papillae more numerous; one only has 16-jointed antennae. Similar variations occur in the soldier and worker castes from different colonies to those observed in Northern Territory series. All are from arboreal termitaria. The proposed new species differs from the specimens from Magnetic Island and Townsville, which I have previously described as the imago of *E. yarrabahensis* Mjob. in its smaller size, smaller, lighter and less hairy head, shorter and paler wings, smaller eyes, narrower pronotum and one joint less in antennae.

The group of termites to which *E. fumipennis* (Walker), *E. exitiosus*, n. sp. and *E. graveolus*, n. sp. belong is undoubtedly one of the most difficult to deal with satisfactorily, and it is beyond doubt that several species have been confused by students of Australian termites owing to the apparent absence of distinguishing characters in both soldiers and workers (the castes most frequently captured). In view of the foregoing I have retained for further study about 30 series which I consider to be undeterminable in the absence of alate imagos.

Biology.—The type colony was found in a termitarium (Plate XXVI., Fig. 39), situated 13 feet from the ground in the fork of a small tree in the coastal scrub near Darwin (23/10/13), and was quite typical of many others in the district. The community comprised a queen, situated in a rather large cell in the middle of the mass, an immense number of eggs, soldiers, workers, larvae,

first- and second-form nymphs and alate males and females. The outer wall of the termitarium was very thin and brittle, with a rugose surface, and was composed largely of vegetable matter. The interior was of similar composition, with small crowded cells and passages in the middle and larger ones towards the exterior. "Tubes" or "covered-ways" extended from the ground to the nest, and thence along the larger branches. A somewhat similar nest (Plate XXVI., Fig. 40), occupied by a queen, soldiers and workers only, was found (16/9/16) about 38 miles south-east from Darwin 18 feet from the ground in a Melaleuca tree, the trunk of which was probably submerged for several months during and after the wet season. This termitarium, like many others in the district, had been used by kingfishers (*Halcyon macleayi*) as a nesting place. Termitaria of this, or a closely allied species, were found on Bathurst Island in mangrove trees the trunks of which were almost continually in tidal water. Soldiers and workers are often found on the ground under fallen logs and vegetable debris, and in "tubes" on the trunks of trees which contain no termitarium; it appears, therefore, that new colonies live in the soil for some time before constructing the typical arboreal nests. This species, like the North Queensland form here, provisionally regarded as a local race of it, never constructs termitaria upon the surface of the ground. "Tubes," under cover of which these termites pass backward and forward between the soil and the nest, are illustrated in Plate XXVI., Figs. 41 and 42. I know of no instance of damage having been done by this species to trees or buildings.

Type imago, soldier and worker in the National Museum of Victoria.

References.

- HOLMGREN, NILS.—Termitenstudien. *Kungl. sv. vet. Akad.*, Bd. 44, No. 3, 1909.
 HILL, G. F.—*Proc. Linn. Soc. N.S.W.*, xlv. (4), 1921.

EXPLANATION OF PLATES.

PLATE XXIII.

- Fig. 1.—*Calotermes oldfieldi*, n. sp. Soldier: Head and pronotum.
 Fig. 2.—*Calotermes oldfieldi*. Soldier: Gula.
 Fig. 3.—*Calotermes obscurus* (Walk.). Imago: Antenna.
 Fig. 4.—*Calotermes obscurus*. Imago: Pronotum, mesonotum and posterior margin of metanotum.
 Fig. 5.—*Calotermes obscurus*. Soldier: Mandible.
 Fig. 6.—*Calotermes obscurus*. Soldier: Antenna.
 Fig. 7.—*Calotermes obscurus*. Soldier: Pro-, meso- and metanotum.
 Fig. 8.—*Calotermes iridipennis* Frogg. Soldier: Head and pronotum.

